

T H E
R E P O R T
O F

JOHN GOLBORNE,
E N G I N E E R,

CONCERNING

The Drainage of the North Level of the Fens,

A N D

The Outfall of the Wisbeach River.

REPORT
OF
THE

JOHN ROOBORNIE
ENGINEER

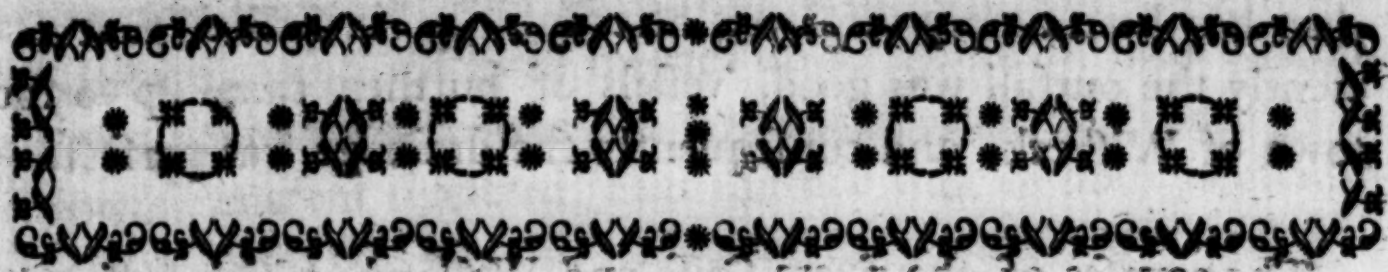
CONCERNING

THE DRAINAGE OF THE NORTH LEVEL OF THE FENS

A. N. KILBETTER, October 3, 1893

IN T to the Directions of the General Com-
missioners of the Fens, and to the
Commissioners of the River Nene from Peterborough
to its outfall at sea, which has
been decayed, and it is found timely steps are
being taken and drainage will be totally lost.





T H E

R E P O R T

O F

JOHN GOLBORNE, ENGINEER.

Chester, October 3, 1769.

PURSUANT to the Directions of the General Commissioners for draining the north level of the fens, I have examined the river Nene, from Peterborough through Wisbech, to its outfall at Sea; which has of late years much decayed, and if some timely steps are not taken, the navigation and drainage will be totally lost.

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I shall not enter into a minute detail of its gradual decay, as that has been amply displayed already; let it suffice, that anciently the outfall was good, vessels of burthen came up to the town of Wisbech, and consequently the drainage was perfect.

The courses of the rivers Ouse and Welland, which antiently had their outfall through Wisbech, being diverted another Way, must have greatly contributed to this misfortune; for it cannot be imagined that part of the Nene alone could keep open so large a channel, when deprived of more than half its waters; it follows, then, that when the channel came beyond the river's end, and ran through a tract of loose, wide, shifting sands, for want of being confined to a due breadth, it expanded itself too much, and thereby so weakened the reflowing current, as to render it unable to carry to sea the silt brought up by the tides, which, subsiding, choaked up the channel so, that, at this time, it is not above six inches deep in some places. The outfall thus decaying, the river upwards must consequently silt up in proportion as the sands rose below; and to such a height are they now risen, that the neap tides do not flow within five miles of Wisbech, and such is the state of drainage, that there was six feet, ten inches of water on the sea apron off Gunthorp-fluice on the 16th day of September last, which is above four feet too high for proper drainage.

It appears by Mr. Elstobb's levels, that the surface of low water in the river Nene, between Peterborough and Wisbech, is five feet higher than the land, and, as I am informed, a spring tide, which flows four hours and a half, and rises sixteen feet at the Eye, flows but an hour and a half and rises but four feet at
Wisbech

Wisbech; so that the tide flows three hours longer, and rises twelve feet higher at the Eye than at Wisbech; for these reasons the last quarters flood only reaches up to the town, and so high are the banks risen beyond the rivers end, and so weak is the reflowing current rendered, that the tide was an hour in ebbing a foot at Wisbech, and the surface of the waters both flood and ebb appeared nearly stagnant. Such is the present condition of the river Nene from Wisbech to its outfall at sea.

I shall now proceed to lay down a method for recovering the ancient outfall, and consequently restoring the navigation and drainage. By Mr. Elstobb's map there are twelve miles from Wisbech to the eye, in which distance there is a fall of twelve feet seven inches, but the present meandering course of the river is fourteen miles through the sands. (see the map) I would propose to cut a new channel through the marshes, from the rivers end to the outfall in the Eye, and to turn the present river down the new channel, by a dam made over the old one, with a proper sluice adjoining to assist in discharging the land floods, if any should descend before the new river could be scrowed to a proper depth; and as water will move with a brisk current, having a fall of three inches and a half in a mile, it follows that three feet six inches will be a sufficient fall from Wisbech to the eye; the remainder then of nine feet being added to four feet (the rise of the tide) makes thirteen feet; so much then will the common spring tides flow at Wisbech, and, admitting the channel to be only three feet deep, at low water, there will then be sixteen feet of water in spring and ten in neap tides, as far as the town of Wisbech. In order to illustrate this matter, I have annexed a copy of Mr. Elstobb's map of the river and bay reduced from his larger map taken in 1767. Perhaps

Perhaps it may be expected, that I should assign a reason, why the new river is continued beyond the Washway-house, when it might, immediately, fall into the present channel there; whereas in going down to the Eye, it must be carried three miles further, through the marshes, and near a mile and a half afterwards through the sands?—To this I answer, that from the Washway-house to the Eye is almost five miles, with five feet ten inches fall, and allowing three inches and a half per mile fall, in that distance, there still remains a fall of four feet four inches; an acquisition of too great consequence to navigation and drainage to be neglected; and it would undoubtedly be an unpardonable fault not to take every advantage, that the situation will admit of.

It is to be considered that vessels, coming from sea, must fetch a great circuit from the Eye, over to the Norfolk shore, before they can get to the Washway-house, (see the map) and that none but small vessels can come there in neap tides: I was down at the Eye, where four vessels were waiting for the spring tides when they endeavoured to come to the Washway-house, as it was then half spring; but the wind being contrary, they were obliged to anchor on the Norfolk coast, (see the map at A) whereas had the river run in a confined channel, which would be two miles shorter through the marshes; these vessels might have been towed up to Wisbech in one tide.

The addition of Luton leam is another great object, for extending the river so low down, especially as those wide loose shifting sands, mentioned by Mr. Elstobb's map would thereby be avoided, and the tide water coming directly from sea into the
new

new channel at the Eye, would be much clearer than that which has run over the banks, from thence to the Washway-house.

And lastly it appears, from the concurrent testimony of all the persons whom I examined, that the channel is leaving the Washway-house, and taking its course by the Norfolk shore; in the line B, (see the map) whereas the channel in the Eye, which has continued more than 150 years, (as appears by ancient records) is so deep that large vessels lye afloat at low water, and has a very bold shore.

I am sensible many are of opinion that the only way to preserve the navigation and drainage would be, by putting a navigable sluice a-cross the river, to discharge the land waters, and to build a new sluice above the Washway-house for drainage. The tide, they say, being stopped out, no sand could be brought in, to choak up the river, this proposition is just, so far as it relates to the course of the river from Peterborough to the sluice; but what is to become of the channel towards the sea. I will however for argument sake, suppose this scheme carried into execution. There is no doubt but the drainage would then be complete, as long as the channel continues to run by the Washway-house, but as the channel is apparently, leaving that course, and going over to the Norfolk shore, it follows, that sand banks will soon rise, and choak up that Outfall, as it formerly did old, and now has new, Gunthorp sluice.

The erecting a sluice to discharge the Nene waters, would certainly prevent the silt from being deposited in the river; but the tide water becoming stagnant, from the time of the gates shutting

ting to their opening again, (let us suppose for three hours only.) They would drop their sediment, which could not be carried to sea by the common run of water passing through the sluice in summer time; let us suppose, therefore, that the land gates are shut down for some days, and a scower let off at low water: the consequence will be, that the current will make a deep hole at the tail of the sluice, and run with great velocity, 'till it comes to the low, loose and wide sands, where it will overflow the whole; and by expanding, loose all its power, and drop all the silt, with which it was loaded, and these scowers being often repeated, will certainly increase the evil they were intended to remove.

I humbly conceive too, that no instance can be produced of deepning a river, under the same circumstances with those of the Nene, by an artificial scower. The Piers of Dover and those of Bridport in Dorsetshire, are, kept open by artificial scowers; but there the currents being confined by the sides of the Piers, run into the sea with great velocity, and carry with them the gravel, thrown in by storms in tempestuous weather. I readily admit, that the present channel cannot be kept open: but the real obstruction to its being so, lies below the rivers end, as I have before observed: but if the river is turned down a confined channel, through the marshes, the cause being removed, the effects must cease.

I have before said, that, by turning the river down a new channel, the surface of low water would be lowered nine feet at Wisbech, and, there being five feet four inches fall from Peterborough to Wisbech, (somewhat more than three inches in a mile,) a sufficient fall for the upland waters remains; so that the

the surface of low water will be also lowered nine feet, at Peterborough-bridge, and if so, then the whole of the Nene waters must resume their ancient course, as the surface of the river will be three feet below the sole of Standground sluice, and the streams that had their outfall at Guyhirn, may return to their former channel: Waldersea Fen may drain by the same outfall, and Bevil's Leam take its old course.

Thus, these waters being carried together down the new channel, will be joined by the several streams in passing to sea, and, like an army that receives reinforcements on its march, will be thereby better enabled to face the enemy, and as the spring-tides will then flow up to Peterborough, they will, by their weight and power, added to that of the Nene water, scower and keep open the Outfall. But in executing this scheme, proper attention must be paid to keep the channel in due bounds; for should it be suffered to expand too much, it will loose in depth, what is gained in breadth, and the silt, like a subtil invader will be ever seeking a place to lye at rest. The Outfall being recovered up to Wisbech; it will be necessary to widen the channel from Guyhirn to Peterborough, and with the earth, that comes out of the bottom, to form a bank at a proper distance, on the south-side to confine the waters in one channel. The river for a mile below Peterborough is intirely stagnant, and about eighteen inches under foil, and there being no more than a foot fall from thence to Knarr Lake, which is ten miles distant, and the new Leam being but twenty feet wide, and Morton's Leam almost silted up at Guyhirn; it follows, that when the land floods descend, they must rise considerably, for want of a proper outfal, and sometimes make a breach in the banks, and lay the adjacent country under water.

To

To remedy this evil, a large space called the Washway is left to receive these waters; but of late years this reservoir has not been large enough to contain them. There is no doubt but the original source of this evil, lies below the rivers end; yet I cannot help thinking, that the river being divided into two channels must be weakned, and thereby accelerate the loss of the outfal.

The great flood in December 1768, rose seven feet eight inches at Peterborough-bridge, and if the surface of low water being lowered nine feet, as I have mentioned before, the river there will then be ten feet and a half under soil, and being confined in one channel, will act with more vigour, and convey its waters in less time to sea. In the mean time it will be necessary to take every opportunity of using the hedge-hogs, to deepen the bed of the river, from below Knarr Lake to Peterborough, in order to relieve the banks in winter, and if the sedges and weeds, in the Washway were mowed down, the water would have a quicker passage to its outfal.

In treating this subject, I have given it all the attention that the importance of the object demands, and I am the more confident, in what I have here asserted, as the river Dee, (which I have under my inspection) like the Nene, formerly expanded it self, through a tract of wide shifting sands, and by which means the navigation was so decayed, that only small vessels could come up to the Quay; but, by cutting a new channel, eight miles through the marshes, and two miles through sands, the Outfall has been recovered, and vessels of large burthen have since come up to the city of Chester.

It cannot be expected that I should be enabled from one view, to lay down the exact course of the intended river, or to set forth with exactness the particulars in the estimate.

If the outlines of a design are sketched, though ever so slightly, and meet with approbation, it is an easy matter to strengthen them. I am not certain whether Gunthorp sluice can be admitted to remain in its present situation, as laid down by Mr. Elstobb's map, I am rather induced to think it must be rebuilt; this, and some other matters of less consequence, must be deferred, 'till the expediency of my propositions are determined, and as that must in some measure depend upon the expence, I have ventured to subjoin an estimate, wherein I flatter myself I have taken sufficient latitude.

ESTIMATE.

To cutting a new channel as ϕ plan, and forming a bank on each side. - - - - -	} 18000 0 0
To making a dam over the river, and building a sluice. - - - - -	} 2000 0 0
To confining the sides of the river, and erecting jettys at the entrance. - - - - -	} 6000 0 0
To contracting the present channel, from the Horse-shoe to the rivers end. - - - - -	} 1000 0 0
To purchase of 240 acres of land for the new river, at 25l. ϕ acre. - - - - -	} 6000 0 0
To widening the river from Guyhirn to Peterborough, and forming a bank on the south-side. - - - - -	} 4000 0 0
To contingencies. - - - - -	} 3000 0 0
	<hr/>
	£ 40,000 0 0

JOHN GOLBORNE:

It cannot be expected that I should be enabled from one view to lay down the exact course of the intended river, or to lay down the exact limits of the proposed estate.

It the outlines of a design are sketched, though ever so slightly, and meet with approbation, it is an easy matter to strengthen them. I am not certain whether Gough's plan can be added to remain in its present situation, as laid down by Mr. Gough's map. I am rather inclined to think it must be re-vised, and some other matters of less consequence, must be determined, till the expediency of my propositions are determined, and as that has been some time depending upon the expense, I have ventured to submit an estimate, wherein I flatter myself I have taken sufficient latitude.

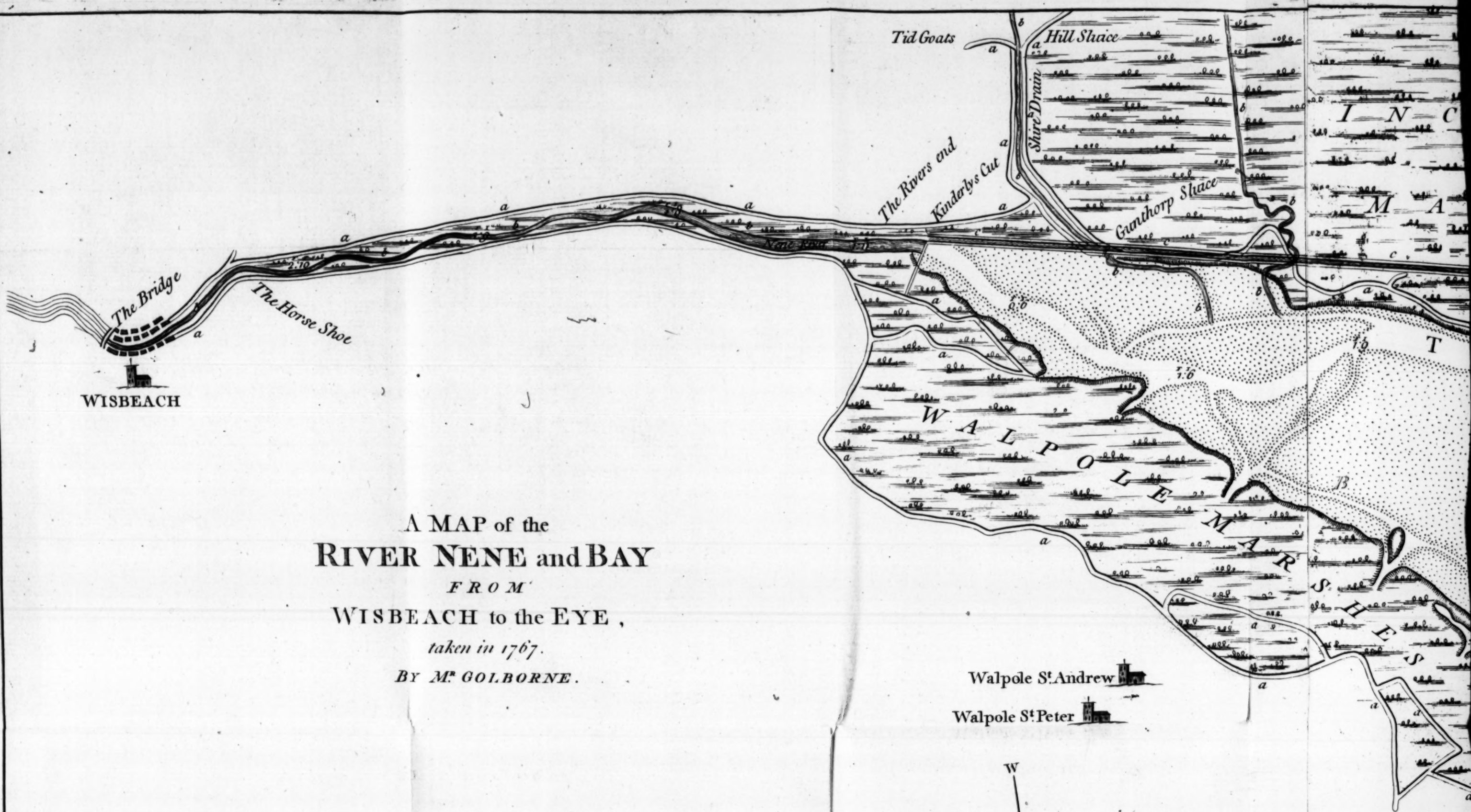
E S T I M A T E .

To cutting a new channel, as Mr. plan, and forming a bank on each side.	18000
To making a dam over the river, and building a sluice.	2000
To continuing the sides of the river, and clearing away at the entrance.	6000
To continuing the present channel from the Horse-pond to the river end.	1000
To purchase of 240 acres of land for the new river, at 4s. per acre.	6000
To widening the river from Gough's to Peterborough, and forming a bank on the south side.	4000
To contingencies.	3000
Total	40000

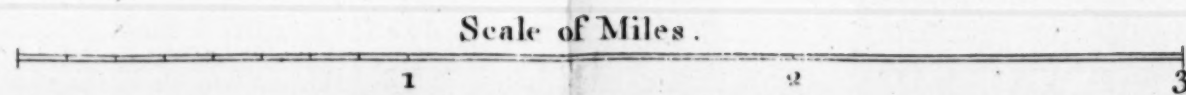
JOHN GOLBORNE.







A MAP of the
RIVER NENE and BAY
 FROM
 WISBEACH to the EYE,
taken in 1767.
 BY M^r GOLBORNE.



The a. a. a. a. denote Sea Banks
The b. b. Rivers and Watercourses
The c. c. the Intended Channel or new Cut.
The Figures the depth of Water at Low Water

